Ubiquitous Computing—
AreWe Crazy?

Yes

The push for ubiquitous computing (UC) relies on an understandable and well-intentioned belief that teaching and schooling need to be transformed.

This view appears credible based on large-scale criteria, such as test scores relative to other countries, drop-out rates, and economic changes. And the use of technology to achieve this goal is attractive, given the dramatic advances that have recently taken place. But the history of our schools tells

By Scott W. DeWitt

No

Ubiquitous means to be everywhere at once, omnipresent. Technology is ubiquitous in our environment. You cannot get a hamburger, buy groceries, or even sign for a package without being faced with technology. Yet in some schools, computers are hard to find, or if they are present, are grouped in a corner to be used as a reward for good behavior. Schools seem to be out of touch with the rest of the world students live in. Are schools living in the past while their purpose is to prepare students for the future?

By Patricia S. Horn

us that reform that ignores teachers' views doesn't work. Teachers need to buy in if sustainable change is going to happen in classrooms. Veteran teachers often initiate rookies by telling them to ignore the newest educational fad because whatever they are already doing will come back in fashion soon enough.

Many of those veterans are engaged, reflective, dedicated teachers working hard to do what is best for their students. As such, these good teachers see their students succeed in school and in life. The feedback they get from students, administrators, and their communities reinforces their view that, although structural changes may be necessary for the system as a whole, radical change in their day-to-

day classroom practice is unnecessary and may be harmful. Thus, trying to convince good teachers to adopt UC by telling them it will transform learning in their classrooms is counterproductive. They know that such change isn't necessary.

Proponents of UC also present student use of technology in school as important for making school relevant to students' lives. I argue that such relevance to students is strongest when schools help students understand the effects of computing on their lives, both individually and within society, rather than helping students learn how to use particular technologies. In other words, let's not teach them how to use Word, instant messaging, or blogs as a way of making school more fun. Let's help them learn about the effects of those tools on them and on society so they can

make informed choices about technology adoption as a way of making school more meaningful.

This approach is based on two premises. First, the technology available to students two decades from now will be different than what is available today. Second, and more significant, technology use has consequences. Proponents of UC frequently imply that all such consequences are positive, but experience and common sense make it clear that is not the case. Many teachers now describe their students as being visual learners and having short attention spans because of television; so too will future students be affected by technology. All progress comes at a price. It is irresponsible to push forward with UC without a systematic effort to understand all of the effects of doing so.

Some "experts" write that students should not use computers until they are seven or eight years old. Perhaps the experts are so caught up in their own perceptions that they are not aware that young people do not listen to experts. The situation reminds me of the buggy-whip manufacturers at the turn of the 20th century who were so concerned with producing good buggy whips that they never noticed that cars were the new mode of transport. In 1989, I wanted to use a drawing program with my kindergarten students. Experts told me that drawing programs were for adults. I didn't listen, and had five-year-olds who could draw, write their names and sentences, and illustrate stories, all using an "adult" program. Today,

it doesn't take a trip to a software site to know how mired in a false premise that advice was. So today, the home environment of most students is rich in technology, while much of the school environment is impoverished.

However, in many places schools are beginning to offer ubiquitous computing to students in one-to-one laptop classrooms. What difference does it make to students in these technology-rich classrooms?

Well, the eyes have it. A teacher can see the difference in the eyes of the students as they enjoy learning and exploring the depth of knowledge available to them. Their focus isn't on the computer, but on using the computer to access information, communicate, or follow their learning passions.

In many classrooms, students are all on the same page in the same book at the same time. Even if the teacher gives everyone the same assignment, students in ubiquitous computing classrooms find multimodal ways to learn based on their personal interests and use individual learning paths daily. Laptop students have many more opportunities for differentiated learning.

Young people today are not learning in the same way adults did when they were children: Chapter One, then Chapter Two. Students focus on knowledge branching in nonlinear formats that more closely match brain activity. Today's adults

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In addition, we need to be clear that computing likely will not be truly ubiquitous unless fundamental changes are made in our educational systems. School districts facing huge deficits, declining enrollments, decrepit physical plants, and pressure for improved test scores on traditional standardized assessments are unable to invest the monetary, political, and social capital necessary to implement UC. Thus, the students in these districts will be pushed even further behind if available funding is allocated to UC rather than to their schools' needs.

We need to teach students to think about, deal with, and predict consequences much more than we need to teach them the particular techniques of use. Such an effort may make it possible to minimize negative consequences—particularly if we show students that their choices in whether or how to use technology matter. That effort can include the use of wireless technologies in classrooms, but it puts the emphasis on students' education in thinking about technology use rather than on what equipment is in students' hands.

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learned material to be used later. Current students want real-time and just-in-time information at their point of need. The only way to truly meet the needs of our students—who are digital natives— is with technology.

However, ubiquitous computing does not mean that students do all of their school work on computers. They read books and do all of the things other students do in school, they just use technology as another resource. Books and teachers will forever be a part of the school environment. Teacher training and commitment are essential and come readily when teachers see what ubiquitous computing does for student learning. Students and teachers will continue to choose the best tool for the job they need to do as technology gives then more options for success.

Students in laptop classrooms get excited about researching and finding information. They find learning exciting and challenging. They spend more time on task and explore subjects more in depth. They are able to match their personal learning styles with the way they explore material. They learn responsibility by taking care of the equipment, and they learn to cooperate and share learning with others. This is what we want for all our children as they prepare to face different challenges in a world we can only imagine. We need to prepare students for the future through ubiquitous computing for all students.

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